

Q1 direction. One of any two neighboring spaces is closed by a plug 52 on the exhaust gas downstream side, and the other one is closed by a plug 53 on the exhaust gas upstream side. Thus, one of the two neighboring spaces serves as an exhaust gas flow-in passage 50 and the other one serves as an exhaust gas flow-out passage 51, causing the exhaust gas to necessarily pass through the partition wall 54 as indicated by arrows in Fig. 22(B). The particulates contained in the exhaust gas are much smaller than the pores of the partition wall 54, but collide with and are trapped on the exhaust gas upstream side surface of the partition wall 54 and the pores surface in the partition wall 54. Thus, each partition wall 54 works as a trapping wall for trapping the particulates. In the present particulate filter 70, in order to oxidize and remove the trapped particulates, an NO_x absorbent and a noble metal catalyst as platinum Pt, which will be explained below, are carried on both side surfaces of the partition wall 54, and preferably also on the pore surfaces in the partition wall 54, by using an alumina or the like.

Page 25, line 8-page 26, line 12, delete current paragraph and insert therefor:

By the way, the ability for absorbing NO_x in the NO_x absorbent has a limit.

Therefore, before the ability saturates, NO_x must be released from the NO_x absorbent.

Q2 Namely, before a current amount of NO_x absorbed in the particulate filter 70 reaches the limit amount of NO_x that can be absorbed therein, NO_x must be released from the particulate filter and the released NO_x must be reduced and purified. For the purpose, a current amount of NO_x absorbed in the particulate filter must be estimated. In the present embodiment, a map of amounts of NO_x absorbed in the particulate filter per a unit time (A) in the low temperature combustion is predetermined as shown in Fig. 24(A). In the map, amounts of NO_x absorbed in the particulate filter per a unit time (A) are set as functions of a required engine load (L) and an engine speed (N). A map of amounts of NO_x absorbed in the particulate filter per a unit time (B) in the normal combustion is predetermined as shown in Fig. 24(B). In the map, amounts of NO_x absorbed in the particulate filter per a unit time (B) are set as functions of a

A² required engine load (L) and an engine speed (N). Therefore, a current amount of NO_x absorbed in the particulate filter can be estimated to integrate these amounts of NO_x absorbed in the particulate filter per a unit time (A) and (B). Here, when the low temperature combustion takes place in a rich air-fuel ratio, the absorbed NO_x is released and thus an amount of NO_x absorbed in the particulate filter per a unit time (A) become a minus value. In the present embodiment, when the estimated amount of NO_x absorbed in the particulate filter becomes more than a predetermined permissible value, the low temperature combustion is carried out at the stoichiometric air-fuel ratio or a rich air-fuel ratio, fuel is injected into the cylinder in the exhaust stroke, or the like, and thus the air-fuel ratio in the surrounding atmosphere of the particulate filter 70 is made stoichiometric or rich to regenerate the particulate filter. This condition is maintained till the regeneration of the particulate filter is finished. The smaller the air-fuel ratio in the surrounding atmosphere is, the shorter the period in which this condition is maintained becomes.

Page 27, lines 20-26, delete current paragraph and insert therefor:

A³ Thus, if the NO_x absorbent and the noble metal catalyst (which are referred to as a catalyst for absorbing and reducing NO_x below) are carried on the particulate filter, the particulate filter is effective to purify NO_x in the exhaust gas and to prevent blocking of the particulate filter meshes with oxidizing and removing the trapped particulates.

Page 33, line 22-page 34, line 4, delete current paragraph and insert therefor:

Q⁴ The residual particulates 63 are gradually transformed into carbonaceous matter that can hardly be oxidized. Further, when the exhaust gas upstream surface is covered with the residual particulates 63, the action of platinum Pt for oxidizing NO and SO₂, and the action of the NO_x absorbent 61 for releasing active-oxygen are suppressed. The residual particulates 63 can be gradually oxidized over a relative long period. However, as shown in Fig. 27(C), other particulates 64 deposit on the residual particulates 63 one after the other,